F 13

```
MMM         MMM  TTTTTTTTTTTTTTT  HHH         HHH  RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
MMM         MMM  TTTTTTTTTTTTTTT  HHH         HHH  RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
MMM         MMM  TTTTTTTTTTTTTTT  HHH         HHH  RRRRRRRRRRRR     TTTTTTTTTTTTTTT  LLL
MMMMMM   MMMMMM        TTT        HHH         HHH  RRR         RRR        TTT        LLL
MMMMMM   MMMMMM        TTT        HHH         HHH  RRR         RRR        TTT        LLL
MMMMMM   MMMMMM        TTT        HHH         HHH  RRR         RRR        TTT        LLL
MMM   MMM   MMM        TTT        HHH         HHH  RRR         RRR        TTT        LLL
MMM   MMM   MMM        TTT        HHH         HHH  RRR         RRR        TTT        LLL
MMM   MMM   MMM        TTT        HHH         HHH  RRR         RRR        TTT        LLL
MMM         MMM        TTT        HHHHHHHHHHHHHHH  RRRRRRRRRRRR           TTT        LLL
MMM         MMM        TTT        HHHHHHHHHHHHHHH  RRRRRRRRRRRR           TTT        LLL
MMM         MMM        TTT        HHHHHHHHHHHHHHH  RRRRRRRRRRRR           TTT        LLL
MMM         MMM        TTT        HHH         HHH  RRR   RRR              TTT        LLL
MMM         MMM        TTT        HHH         HHH  RRR   RRR              TTT        LLL
MMM         MMM        TTT        HHH         HHH  RRR   RRR              TTT        LLL
MMM         MMM        TTT        HHH         HHH  RRR      RRR           TTT        LLL
MMM         MMM        TTT        HHH         HHH  RRR      RRR           TTT        LLL
MMM         MMM        TTT        HHH         HHH  RRR      RRR           TTT        LLL
MMM         MMM        TTT        HHH         HHH  RRR         RRR        TTT        LLLLLLLLLLLLLLL
MMM         MMM        TTT        HHH         HHH  RRR         RRR        TTT        LLLLLLLLLLLLLLL
MMM         MMM        TTT        HHH         HHH  RRR         RRR        TTT        LLLLLLLLLLLLLLL
```

```
**FILE**ID**MTHDIM

MM      MM  TTTTTTTTTT  HH      HH  DDDDDDDD        IIIIII    MM      MM
MM      MM  TTTTTTTTTT  HH      HH  DDDDDDDD        IIIIII    MM      MM
MMMM  MMMM      TT      HH      HH  DD      DD        II      MMMM  MMMM
MMMM  MMMM      TT      HH      HH  DD      DD        II      MMMM  MMMM
MM  MM  MM      TT      HH      HH  DD      DD        II      MM  MM  MM
MM  MM  MM      TT      HH      HH  DD      DD        II      MM  MM  MM
MM      MM      TT      HHHHHHHHHH  DD      DD        II      MM      MM
MM      MM      TT      HHHHHHHHHH  DD      DD        II      MM      MM
MM      MM      TT      HH      HH  DD      DD        II      MM      MM
MM      MM      TT      HH      HH  DD      DD        II      MM      MM
MM      MM      TT      HH      HH  DD      DD        II      MM      MM    ....
MM      MM      TT      HH      HH  DD      DD        II      MM      MM    ....
MM      MM      TT      HH      HH  DDDDDDDD        IIIIII    MM      MM    ....
MM      MM      TT      HH      HH  DDDDDDDD        IIIIII    MM      MM    ....

LL          IIIIII      SSSSSSSS
LL          IIIIII      SSSSSSSS
LL            II      SS
LL            II      SS
LL            II      SS
LL            II      SS
LL            II        SSSSSS
LL            II        SSSSSS
LL            II              SS
LL            II              SS
LL            II              SS
LL            II              SS
LLLLLLLLLL  IIIIII    SSSSSSSS
LLLLLLLLLL  IIIIII    SSSSSSSS
```

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```
   (2)        50        HISTORY         ; Detailed Current Edit History
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   (5)       135        MTH$JIDIM
   (6)       178        MTH$DIM
   (7)       222        MTH$DDIM
   (8)       266        MTH$GDIM
   (9)       309        MTH$HDIM
```

```
0000        .TITLE  MTH$DIM         possitive difference functions
0000        .IDENT  /1-002/         ; File: MTHDIM.MAR
0000
0000   ;
0000   ;****************************************************************************
0000   ;*                                                                          *
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0000   ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                 *
0000   ;*                                                                          *
0000   ;*                                                                          *
0000   ;****************************************************************************
0000   ;
0000   ;
0000   ; FACILITY: MATH LIBRARY
0000   ;++
0000   ; ABSTRACT:
0000   ;       This module contains the positive difference routines.
0000   ;       Positive difference (a,b) is defined to be MAX(a-b,0)
0000   ;
0000   ;
0000   ;--
0000   ;
0000   ; VERSION: 1
0000   ;
0000   ; HISTORY:
0000   ;
0000   ; AUTHOR:
0000   ;       Jonathan M. Taylor, 14-JUL-77: Version 0
0000   ;
0000   ; MODIFIED BY:
0000   ;
0000   ;
0000   ;
```

```
0000             .SBTTL  HISTORY          ; Detailed Current Edit History
0000
0000
0000      ; Edit History for Version 1 of MTH$DIM
0000      ;
0000      ; 0-4   - Remove MTH$FLAG_JACKET.  TNH 5-July-78
0000      ; 1-001 - Update version number and copyright notice.  JBS 16-NOV-78
0000      ; 1-002 - Add MTH$GDIM, MTH$HDIM.  SBL 18-Jan-79
```

```
    0000     59          .SBTTL  DECLARATIONS
    0000     60
    0000     61 ;
    0000     62 ; INCLUDE FILES:
    0000     63 ;        NONE
    0000     64 ;
    0000     65
    0000     66 ;
    0000     67 ; EXTERNAL SYMBOLS:
    0000     68 ;        NONE
    0000     69 ;
    0000     70
    0000     71 ;
    0000     72 ; MACROS:
    0000     73 ;        NONE
    0000     74 ;
    0000     75
    0000     76 ;
    0000     77 ; PSECT DECLARATIONS:
00000000     78          .PSECT  _MTH$CODE       PIC, SHR, LONG, EXE, NOWRT
    0000     79
    0000     80 ;
    0000     81 ; EQUATED SYMBOLS:
    0000     82 ;        NONE
    0000     83 ;
    0000     84
    0000     85 ;
    0000     86 ; OWN STORAGE:
    0000     87 ;        NONE
    0000     88 ;
```

```
                          0000          .SBTTL  MTH$IIDIM
                          0000
                          0000   ;++
                          0000   ; FUNCTIONAL DESCRIPTION:
                          0000          Returns, as routine value, the positive difference of two
                          0000          INTEGER*2 arguments.
                          0000   ;
                          0000   ;
                          0000   ; CALLING SEQUENCE:
                          0000          Positive_difference.ww.v = MTH$IIDIM (a1.rw.r, a2.rw.r)
                          0000   ;
                          0000   ;
                          0000   ;
                          0000   ; INPUT PARAMETERS:
                          0000          a1              adr of INTEGER*2 value
                          0000          a2              adr of INTEGER*2 value
                          0000   ;
                          0000   ;
                          0000   ; IMPLICIT INPUTS:
                          0000          NONE
                          0000   ;
                          0000   ; OUTPUT PARAMETERS:
                          0000          NONE
                          0000   ;
                          0000   ; IMPLICIT OUTPUTS:
                          0000          NONE
                          0000   ;
                          0000   ; COMPLETION CODES:
                          0000          NONE
                          0000   ;
                          0000   ; SIDE EFFECTS:
                          0000          SIGNALS Integer Overflow if  a1-a2  overflows.
                          0000   ;
                          0000   ;
                          0000   ;--
                          0000
                          0000
                          0000
                          0000
                    4000  0000          .ENTRY  MTH$IIDIM,      ^M<IV>  ; enable integer overflow
 50   04 BC   08 BC   A3  0002          SUBW3   @8(AP), @4(AP), R0      ; R0 = difference of args
                  02  18  0008          BGEQ    1$                      ; return if non-negative
                  50  B4  000A          CLRW    R0                      ; else return 0
                      04  000C   1$:    RET
```

```
                                   000D   135           .SBTTL  MTH$JIDIM
                                   000D   136
                                   000D   137  ;++
                                   000D   138  ; FUNCTIONAL DESCRIPTION:
                                   000D   139  ;        Returns, as routine value, the positive difference of two
                                   000D   140  ;        INTEGER*4 arguments.
                                   000D   141  ;
                                   000D   142  ;
                                   000D   143  ; CALLING SEQUENCE:
                                   000D   144  ;        Positive_difference.wl.v = MTH$JIDIM (a1.rl.r, a2.rl.r)
                                   000D   145  ;
                                   000D   146  ;
                                   000D   147  ;
                                   000D   148  ; INPUT PARAMETERS:
                                   000D   149  ;        a1              adr of INTEGER*4 value
                                   000D   150  ;        a2              adr of INTEGER*4 value
                                   000D   151  ;
                                   000D   152  ;
                                   000D   153  ; IMPLICIT INPUTS:
                                   000D   154  ;        NONE
                                   000D   155  ;
                                   000D   156  ; OUTPUT PARAMETERS:
                                   000D   157  ;        NONE
                                   000D   158  ;
                                   000D   159  ; IMPLICIT OUTPUTS:
                                   000D   160  ;        NONE
                                   000D   161  ;
                                   000D   162  ; COMPLETION CODES:
                                   000D   163  ;        NONE
                                   000D   164  ;
                                   000D   165  ; SIDE EFFECTS:
                                   000D   166  ;        SIGNALS Integer Overflow if  a1-a2  overflows.
                                   000D   167  ;
                                   000D   168  ;
                                   000D   169  ;--
                                   000D   170
                                   000D   171
                             4000  000D   172           .ENTRY  MTH$JIDIM,      ^M<IV>  ; enable integer overflow
          50    04 BC    08 BC  C3  000F   173           SUBL3   @8(AP), @4(AP), R0      ; R0 = difference of args
                             02  18  0015   174           BGEQ    1$                      ; return if non-negative
                             50  D4  0017   175           CLRL    R0                      ; else return 0
                                 04  0019   176 1$:       RET
```

```
                         001A          .SBTTL  MTH$DIM
                         001A
                         001A    ;++
                         001A    ; FUNCTIONAL DESCRIPTION:
                         001A    ;         Returns, as routine value, the positive difference of two
                         001A    ;         REAL*4 arguments.
                         001A    ;
                         001A    ;
                         001A    ; CALLING SEQUENCE:
                         001A    ;         Positive_difference.wf.v = MTH$DIM (a1.rf.r, a2.rf.r)
                         001A    ;
                         001A    ;
                         001A    ;
                         001A    ; INPUT PARAMETERS:
                         001A    ;         a1              adr of a single-precision floating-point value
                         001A    ;         a2              adr of a single-precision floating-point value
                         001A    ;
                         001A    ;
                         001A    ; IMPLICIT INPUTS:
                         001A    ;         NONE
                         001A    ;
                         001A    ; OUTPUT PARAMETERS:
                         001A    ;         NONE
                         001A    ;
                         001A    ; IMPLICIT OUTPUTS:
                         001A    ;         NONE
                         001A    ;
                         001A    ; COMPLETION CODES:
                         001A    ;         NONE
                         001A    ;
                         001A    ; SIDE EFFECTS:
                         001A    ;         Floating Overflow, Floating Underflow, and Reserved Operand
                         001A    ;         exceptions can occur.
                         001A    ;
                         001A    ;
                         001A    ;--
                         001A
                         001A
                   0000  001A          .ENTRY  MTH$DIM,          ^M<>
 50   04 BC   08 BC   43  001C          SUBF3   @8(AP), @4(AP), R0        ; R0 = difference of args
              02   18  0022          BGEQ    1$                        ; return if non-negative
              50   D4  0024          CLRL    R0                        ; else return 0
                   04  0026    1$:    RET
```

```
                         0027            .SBTTL  MTH$DDIM
                         0027
                         0027    ;++
                         0027    ; FUNCTIONAL DESCRIPTION:
                         0027    ;       Returns as routine value, the positive difference of two
                         0027    ;       REAL*8 numbers.
                         0027    ;
                         0027    ;
                         0027    ; CALLING SEQUENCE:
                         0027    ;       Positive_difference.wd.v = MTH$DDIM (a1.rd.r, a2.rd.r)
                         0027    ;
                         0027    ;
                         0027    ;
                         0027    ; INPUT PARAMETERS:
                         0027    ;       a1              adr of a double-precision floating-point value
                         0027    ;       a2              adr of a double-precision floating-point value
                         0027    ;
                         0027    ; IMPLICIT INPUTS:
                         0027    ;       NONE
                         0027    ;
                         0027    ; OUTPUT PARAMETERS:
                         0027    ;       NONE
                         0027    ;
                         0027    ; IMPLICIT OUTPUTS:
                         0027    ;       NONE
                         0027    ;
                         0027    ; COMPLETION CODES:
                         0027    ;       NONE
                         0027    ;
                         0027    ; SIDE EFFECTS:
                         0027    ;       Floating Overflow, Floating Underflow, and Reserved Operand
                         0027    ;       exceptions can occur.
                         0027    ;
                         0027    ;
                         0027    ;--
                         0027
                   0000  0027            .ENTRY  MTH$DDIM,       ^M<>
 50   04 BC   08 BC  63  0029            SUBD3   @8(AP), @4(AP), R0      ; R0 = difference of args
                 02  18  002F            BGEQ    1$                      ; return if non-negative
                 50  7C  0031            CLRQ    R0                      ; else return 0
                     04  0033    1$:     RET
                         0034
                         0034
                         0034             .SBTTL  MTH$GDIM
                         0034
                         0034     ;++
                         0034     ; FUNCTIONAL DESCRIPTION:
                         0034     ;       Returns as routine value, the positive difference of two
                         0034     ;       G floating numbers.
                         0034     ;
                         0034     ;
                         0034     ; CALLING SEQUENCE:
                         0034     ;
                         0034     ;       Positive_difference.wg.v = MTH$GDIM (a1.rg.r, a2.rg.r)
                         0034     ;
                         0034     ;
                         0034     ; INPUT PARAMETERS:
                         0034     ;
                         0034     ;       a1      - address of a G floating value
                         0034     ;       a2      - address of a G floating value
                         0034     ;
                         0034     ; IMPLICIT INPUTS:
                         0034     ;       NONE
                         0034     ;
                         0034     ; OUTPUT PARAMETERS:
                         0034     ;       NONE
                         0034     ;
                         0034     ; IMPLICIT OUTPUTS:
                         0034     ;       NONE
                         0034     ;
                         0034     ; COMPLETION CODES:
                         0034     ;       NONE
                         0034     ;
                         0034     ; SIDE EFFECTS:
                         0034     ;       Floating Overflow, Floating Underflow and Reserved Operand
                         0034     ;       exceptions can occur.
                         0034     ;
                         0034     ;
                         0034     ;--
                         0034
                   0000  0034             .ENTRY  MTH$GDIM, ^M<>
50   04 BC   08 BC 43FD  0036             SUBG3   @8(AP), @4(AP), R0      ; R0 = difference of args
                02   18  003D             BGEQ    1$                      ; return if non-negative
                50   7C  003F             CLRQ    R0
                     04  0041     1$:     RET                             ; return
```

```
                                0042          .SBTTL  MTH$HDIM
                                0042
                                0042    ;++
                                0042    ; FUNCTIONAL DESCRIPTION:
                                0042    ;       Returns the positive difference of two H floating numbers.
                                0042    ;       Because an H floating number can not be represented in
                                0042    ;       64 bits, it is returned to the first argument; the input
                                0042    ;       parameters being shifted to the second and third arguments,
                                0042    ;       as per system convention.
                                0042    ;
                                0042    ;
                                0042    ; CALLING SEQUENCE:
                                0042    ;
                                0042    ;       CALL MTH$HDIM (Positive_difference.wh.r, a1.rh.r, a2.rh.r)
                                0042    ;
                                0042    ;
                                0042    ; INPUT PARAMETERS:
                                0042    ;
                                0042    ;       a1      - address of a H floating value
                                0042    ;       a2      - address of a H floating value
                                0042    ;
                                0042    ; IMPLICIT INPUTS:
                                0042    ;       NONE
                                0042    ;
                                0042    ; OUTPUT PARAMETERS:
                                0042    ;       Positive_difference     - H floating result by reference
                                0042    ;
                                0042    ; IMPLICIT OUTPUTS:
                                0042    ;       NONE
                                0042    ;
                                0042    ; COMPLETION CODES:
                                0042    ;       NONE
                                0042    ;
                                0042    ; SIDE EFFECTS:
                                0042    ;       Floating Overflow, Floating Underflow and Reserved Operand
                                0042    ;       exceptions can occur.
                                0042    ;
                                0042    ;
                                0042    ;--
                                0042
                          0000  0042          .ENTRY  MTH$HDIM, ^M<>
   04 BC    08 BC    0C BC 63FD  0044          SUBH3   @12(AP), @8(AP), @4(AP) ; @4(AP) = difference of args
                       04   18  004C          BGEQ    1$                      ; return if non-negative
                    04 BC 7CFD  004E          CLRH    @4(AP)
                            04  0052  1$:     RET                             ; return
                                0053
                                0053
                                0053          .END
```

```
MTH$DDIM          00000027 RG     01
MTH$DIM           0000001A RG     01
MTH$GDIM          00000034 RG     01
MTH$HDIM          00000042 RG     01
MTH$IIDIM         00000000 RG     01
MTH$JIDIM         0000000D RG     01

                                                   +----------------+
                                                   ! Psect synopsis !
                                                   +----------------+

PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (  0.)  NOPIC    USR   CON    ABS    LCL NOSHR NOEXE NORD   NOWRT NOVEC BYTE
_MTH$CODE                       00000053  (   83.)  01 (  1.)    PIC    USR   CON    REL    LCL   SHR   EXE   RD   NOWRT NOVEC LONG

                                                +------------------------+
                                                ! Performance indicators !
                                                +------------------------+

Phase                       Page faults    CPU Time       Elapsed Time
-----                       -----------    --------       ------------
Initialization                       32    00:00:00.11    00:00:00.66
Command processing                  117    00:00:00.47    00:00:02.85
Pass 1                               78    00:00:00.61    00:00:03.27
Symbol table sort                     0    00:00:00.00    00:00:00.00
Pass 2                               70    00:00:00.72    00:00:02.60
Symbol table output                   2    00:00:00.01    00:00:00.01
Psect synopsis output                 2    00:00:00.02    00:00:00.13
Cross-reference output                0    00:00:00.00    00:00:00.00
Assembler run totals                303    00:00:01.95    00:00:09.52

The working set limit was 900 pages.
3561 bytes (7 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 6 non-local and 6 local symbols.
356 source lines were read in Pass 1, producing 25 object records in Pass 2.
0 pages of virtual memory were used to define 0 macros.

                                               +--------------------------+
                                               ! Macro library statistics !
                                               +--------------------------+

Macro library name                             Macros defined
------------------                             --------------
_$255$DUA28:[SYSLIB]STARLET.MLB;2                         0

0 GETS were required to define 0 macros.

There were no errors, warnings or information messages.

MACRO/ENABLE=SUPPRESSION/DISABLE=(GLOBAL,TRACEBACK)/LIS=LIS$:MTHDIM/OBJ=OBJ$:MTHDIM MSRC$:MTHDIM/UPDATE=(ENH$:MTHDIM)
```

0259 AH-BT13A-SE
VAX/VMS V4.0

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